A FORM OF TOTAL THIRD NERVE PARALYSIS,
TYPICAL OF A UNILATERAL NUCLEAR
Lesion; With A Case.

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Mrs. B—, a strong and healthy-looking white woman, thirty years of age, was first seen at my clinic at the Eye and Ear Hospital, August 11th, 1897. She stated that on July 21st last she had had an attack of vertigo, of moderate severity, which passed off completely in the course of a day or two, and one week later she noticed drooping of the lid of her left eye. She said that she had always been in good health, had never had a miscarriage and positively denied any specific taint.

Examination.—In the R. E. the pupil measures 3 m.m. in diameter and reacts promptly to light and accommodation. Vision 20/20, with plus 3 sph. 20/20. With correction (plus 3.D) reads Jaeger No. 1, 8—21 ins. In L. E., the pupil measures a little over 6 m.m. in diameter and fails to contract to light or accommodation. Vision 20/200, with plus 3 sph. 20/20 nearly. In this eye (the left) there is complete paralysis of accommodation, complete ptosis, divergent strabismus and loss of movement in all directions except outward. There is secondary deviation of the right eye outward. Crossed diplopia, the image of the left eye being higher than its fellow and upright, the upper extremity of the image of the right eye being inclined to the right. The lateral distance between the images increases as the test-object is carried to the right. If the test-object is moved upward, the difference in height and the inclination of the image of the right eye increase.
The loss of movement, inward, upward and downward, of the left eye, indicates paralysis of the internal, superior and inferior recti, while the preservation of outward movement and the upright character of the image, shows that the external rectus, superior and inferior obliques, are not affected. There is no apparent limitation of movement in the right eye, but the upper extremity of the image seen by this eye is inclined to the right. In paralysis of an inferior oblique muscle, the upper extremity of the false image is inclined toward the affected side, i.e., in paralysis of the right inferior oblique the upper extremity of the image in the right eye is inclined to the right side.

There is, then, in this case paralysis of all the muscles in the left eye supplied by the third nerve except the inferior oblique, and in the right eye paralysis of the inferior oblique alone, i.e., paralysis of one complete set of muscles supplied by the third nerve, but distributed in a particular way between the two eyes.

We are all familiar with the description of total third nerve paralysis given in the books, which is substantially as follows: There is crossed diplopia, the image of the affected eye being higher than its fellow, and its upper extremity inclined to the affected side the lateral distance between them increasing as the test-object is moved toward the sound side. If the test-object is moved upward, the difference in height and the inclination of the false image increase. There is divergent strabismus and limitation of movement in all directions, except outward and slightly downward. The secondary deviation of the sound eye is outward, the false projection of the field of vision is to the inner side, and the face is inclined toward the affected side, the chin being tipped upward. In addition, there is ptosis, medium dilatation of the pupil, which fails to contract to light, and paralysis of accommodation.

All of the authorities that I have been able to consult adhere more or less closely to the above description as typical of total third nerve paralysis, and endeavor to differen-
tiate between cases due to a peripheral lesion and cases due to a nuclear lesion. In my opinion, this description is applicable only to cases of total third nerve paralysis due to a peripheral lesion, while the case which I report above is typical of total third nerve paralysis due to a unilateral nuclear lesion.

In support of this opinion, it will only be necessary to call attention to the manner in which the root fibres leave the nuclei.

Jakob¹ says: "The nerve fibres pass out of the nucleus as the roots of the motor oculi on the same side, in

lesser part also decussating with the fibres of the other side, and run in the motor oculi trunk to the muscles of the eye." Hill\(^2\) says: "Most of the fibres come from the gray matter on the same side of the brain, but some cross to the opposite side before taking exit." Knies\(^3\) says: "Hence the motor oculi nucleus of each side contains the nuclei of those muscles which take part in the movement of both eyes toward the opposite side, i. e., the internal, superior and inferior recti of the same eye and the inferior oblique of the opposite eye." Granting the statements of these authorities to be correct, the accompanying figure, modified from Knies, will illustrate how a unilateral lesion affecting the whole of the third nerve nucleus on the left side of the brain, must result in the particular form of paralysis found in my case.

Therefore, to Starr's conclusion\(^4\) that "if all the muscles of the eyeball supplied by the third nerve are affected, including the iris, the case is one of total peripheral paralysis of the third nerve, and the lesion lies on the base of the brain," I would add the following, "but if all the muscles of one eye supplied by the third nerve are affected, except the inferior oblique, with paralysis of the inferior oblique alone of the opposite eye, the case is one of total unilateral nuclear paralysis of the third nerve, and the lesion lies on the same side as the eye in which the inferior oblique is not affected and on the opposite side to the eye in which the inferior oblique is alone affected."

\(^3\)Max Knies, The Eye in General Diseases. Wm. Wood & Co., 1895.
\(^4\)M. Allen Starr, Journal of Nervous and Mental Disease, May, 1888.